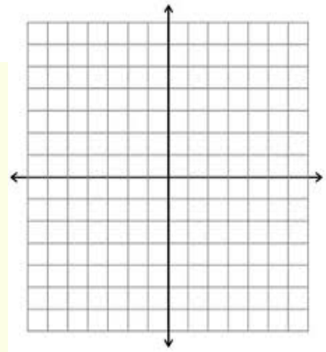
Alg. 2 Warm Up # 5-4

1. Sketch the graph of $y = \log_5(x-2)$ and describe how the graph is transformed from the parent graph.



2. Given $f(x) = -2x^2 - 4$ and $g(x) = 5x + 3$, find:

a. $g(-2)$ b. $f(-7)$ c. $f(g(-2))$ d. f(g(x))

Preview

HW Questions:

6-21. For each of the following equations, find every point where its *three-dimensional* graph intersects one of the coordinate axes. That is, find the *x*-, *y*- and *z-intercepts*. Express your answer in (x, y, z) form.

a. $6y + 15z = 60$ (0,10,0) (0,0,4)

b. $3x + 4y + 2z = 24$ (8,0,0) (0,6,0) (0,0,12)

c. $(x+3)^2 + z^2 = 25$ (0,0,±4) (-8,0,0) (2,0,0)

d. $z = 6$ (0,0,6)

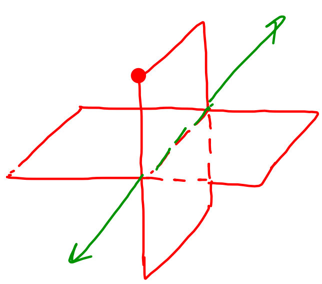
6-22. Answer each of the following questions. Illustrate your answers with a sketch.

a. What do you think the intersection of two planes looks like?

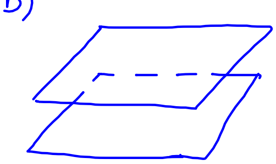
b. What do you think it means for two planes to be parallel?

c. What do you think it means for a line and a plane to be parallel?

a)

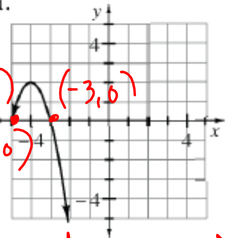


b)

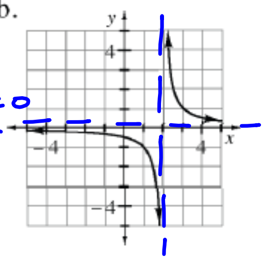


6-23. Find an equation that will generate each graph.

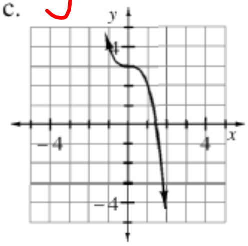
a.



b.



c. $y=$



parent: $y=x^2$

$y=a(x+4)^2+2$

$0=a(-3+4)^2+2$

$y=a(x+5)(x+3)$

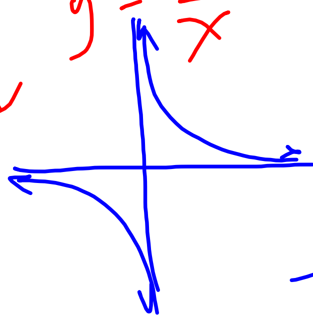
$2=a(-4+5)(-4+3)$

$a=-2$

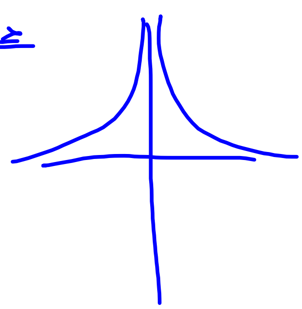
6-24. Is $y=\frac{1}{x}$ the parent of $y=\frac{1}{x^2+7}$? Explain your reasoning.

No,

$y=\frac{1}{x}$



$y=\frac{1}{x^2}$



6-25. Solve each equation below for x.

a. $2x+x=b$ b. $2ax+3ax=b$ c. $x+ax=b$

$x(1+a)=b$

$x=\frac{b}{1+a}$

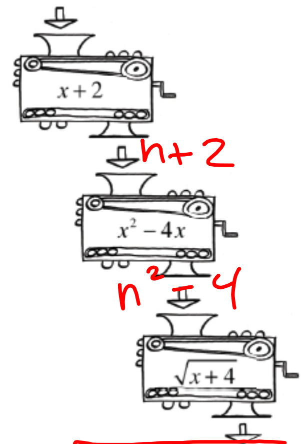
6-26. Mark claims to have created a sequence of three function machines that always gives him the same number he started with.

a. Test his machines. Do you think he is right?

b. Be sure to test negative numbers. What happens for negative numbers?

c. Mark wants to get his machines patented but has to prove that the set of machines will always do what he says it will, at least for positive numbers. Show Mark how to prove that his machines work for positive numbers by dropping in a variable (for example, n) and writing out each step the machines must take.

d. Why do the negative numbers come out positive?



$\sqrt{n^2-4+4}$

$(n+2)^2-4(n+2)$

$n^2+4n+4-4n-8$

n^2-4

$(\sqrt{n})^2 = \sqrt{n^2}$

$|n|$

Yesterday's CP's:

6-18. Now you will work with your team to graph $12x+4y+5z=60$.

a. What do you think it will look like? a plane

b. Which of the strategies you used to graph a two-variable equation in problem 6-17 can be used to graph this three-variable equation? Work with your team to find a strategy and then graph $12x+4y+5z=60$ on your isometric dot paper. Be prepared to share your strategy with the class.

x-int

$12x+4(0)+5(0)=60$

$12x=60$

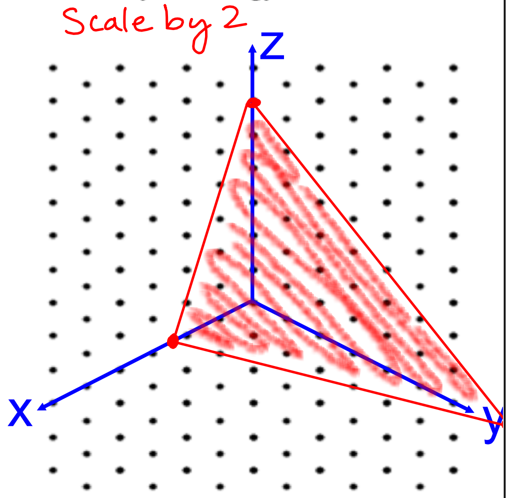
$x=5$

$(5,0,0)$

y-int: $(0,15,0)$

z-int: $(0,0,12)$

Scale by 2

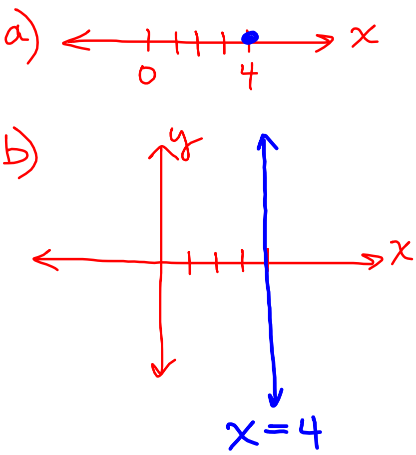


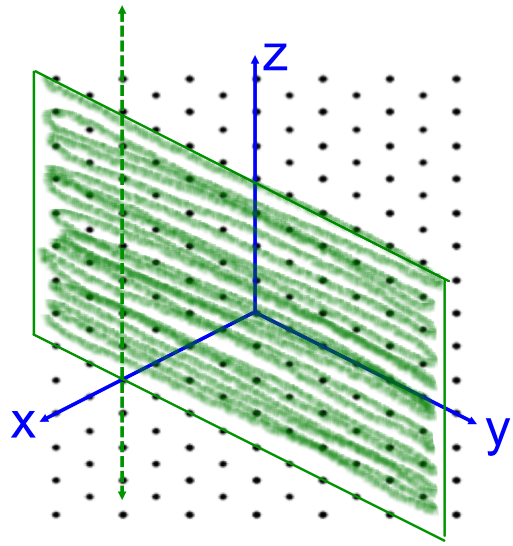
6-20. Consider the graph of $x = 4$ for each of the following problems.

a. Graph the solution to $x = 4$ in one dimension (on a number line).

b. Graph the solutions to $x = 4$ in two dimensions (on the xy-plane).

c. Graph the solutions to $x = 4$ in three dimensions (in the xyz-space).





CP's: 6- # 31 ---> 33, 35

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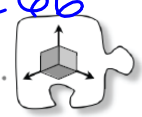
6.1.3 What can I discover about 3-D systems?



Systems of Three-Variable Equations

You know a lot about systems of two-variable equations, their solutions, and their graphs. Today you will investigate systems of three-variable equations.

Discuss as a class:

6-30. THREE-DIMENSIONAL SYSTEM INVESTIGATION

Consider the following systems of equations:

System I	*System II*
$20x + 12y + 15z = 60$	$20x + 15y + 12z = 60$
$20x + 12y + 15z = 120$	$10x + 30y + 12z = 60$

Your Task: With your team, find out as much as you can about each of these systems of equations, their graphs, and their solutions. Be sure to record all of your work carefully and be prepared to share your summary statements with the class.

Discussion Points

What does the graph of a three-variable equation look like? a plane

What does it mean to be a solution to a system of equations?

What does a solution to a three-variable system of equations look like on a graph?

Is there always a solution to a system of equations?

CP's: 6- # 31 ---> 33, 35

Further Guidance

6-31. Using isometric dot paper, graph both equations in *System I* from problem 6-30 on a single three-dimensional coordinate system. Use different colors to help identify each graph.

a. Describe the graph of the system in as much detail as you can.

b. Looking at the graph, can you tell what the solution to this system is? Explain.

Week 5 Classwork

Warm up on top

CP's: 6- #1 ---> 6 (green)

CP's: 6- # 16 ---> 20

(with one sheet of iso paper)

CP's: 6- # 31 ---> 33, 35

(with one sheet of iso paper)

6-32. Using isometric dot paper, graph both equations in *System II* from problem 6-30 on a single three-dimensional coordinate system. Use different colors to help identify each graph.

a. Describe the graph of the system in as much detail as you can.

b. Looking at the graph, can you tell what the solution to this system is? Explain.

6-33. Now compare the graphs of the two systems. How are they similar? How are they different?

Further Guidance section ends here.

6-35. On isometric dot paper, graph the system of equations at right. What shape is the intersection? Use color to show the intersection clearly on your graph.

$$10x + 6y + 5z = 30$$
$$6x + 15y + 5z = 30$$

HW: 6 - # 36 ---> 43
(skip 42)

Friday Quiz:

Graph a log

Log <-----> Exponent form

Simplify a rational expression